

Development and prototyping of a bicycle dummy for automotive safety testing

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| Relevance to the Automotive Industry: | Safety is one the most import research topic in today's automotive industry, and of particular interest is the safety of vulnerable road users (VRUs), such as pedestrians and bicyclists. It is therefore important to study scenarios where vehicles and VRUs interact, including using both virtual and physical traffic tests, to ensure their safety. Hence it is important to develop physical dummies for use as substitutes for VRUs in these physical tests. These dummies must be realistic and functional to answer issues being investigated. | |
| Research Location: | Technische Universität Darmstadt Institute for Automotive Engineering (FDZ) | |
| Homepage (Engl.): | http://www.fzd.tu-darmstadt.de | |
| Faculty Mentor: | Prof. Dr.-Ing. Steven Peters | |
| Faculty Mentor Email: | steven.peters@tu-darmstadt.de | |
| Graduate Mentors: | Kai Storms, M.Sc. | |
| Graduate Mentor Emails: | kai.storms@tu-darmstadt.de | |
| Project Description: | <p>The Technische Universität Darmstadt Institute for Automotive Engineering (FZD) is participating in the national research project <i>Verification and Validation Methods</i>. QUICK READ: https://www.fzd.tu-darmstadt.de/forschung/research_projects_fzd/vvm/rp_vvm.en.jsp</p> <p>This NSF REU project will be concerned with testing scenarios for the safety of highly automated driving. The objective for the NSF REU student is to develop a bicycle dummy for use in closed track tests. This includes development of a dummy concept, a concept for motion simulation, a risk analysis as well as the assembly and evaluation of an initial prototype.</p> <p>PHASE A (2 weeks): During this introduction phase, the NSF REU student will review relevant research; investigate existing concepts; identify key requirements in consultation with their supervisors; and detail and distribute project responsibilities.</p> <p>PHASE B (3 weeks): Next, the NSF REU student will develop solution concepts, analyze these concepts with regards to the identified requirements, select the best solution, and document this work.</p> <p>PHASE C (3 weeks): Next, the NSF REU student will produce a prototype; and then test and validate, first the individual components, and then the integrated system.</p> <p>PHASE D (2 weeks): Finally, the NSF REU student will document the research performed, prepare a written report, and deliver an end-of-summer presentation on the research performed.</p> | |
| May 30 - Aug 06, 2022 (10 weeks, 40 h/week) | | |
| Target publications: | <ul style="list-style-type: none"> WKM Symposium Scientific Society for Motor Vehicle and Engine Technology, https://www.wkm-ev.de/de/symposium.html | |
| Necessary Skills/ Knowledge: | <ul style="list-style-type: none"> Experience with engineering concept development Practical prototyping work | |
| Desirable Skills/ Knowledge: | <ul style="list-style-type: none"> Experience with automotive safety | |
| Additional Online Resource(s): | | |

NSF REU Students must have completed at least two semesters of engineering studies prior to the proposed summer research, and they must have at least one semester remaining before they can earn their BS in Engineering.